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ABSTRACT

The object of this research was to develop a measure of motivation of elementary school children to predict academic achievement independent of intelligence. Three basic steps were proposed to analyze data from approximately200 Black children. These steps were: 1) operational (content) analysis of two free response measures, resulting in a coder's manual, 2) tests of reliability of the measure, 3) tests of the validity of the measure. Procedures included establishment of coder reliability, test homogeneity and stability; determination of discriminant validity, predictive validity, and experimental validity of the new test. Results indicate that the measure meets criteria which make it useful for experimental purposes and has comparable reliability and validity to other free response measures of motivation. It is significantly related to verbal measures of academic achievement independent of intelligence. The amount of significant variance accounted for is small. Classroom motivation training units were strikingly reflected in the measure demonstrating its validity experimentally. (Author/CK)

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Final Report
Project No. 59176
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MOTIVATION MEASURE FOR ELEMENTARY SCHOOL CHILDREN
(Origin-Pawn Measure)

Richard de Charms
Washington University
St. Louis, Missouri 63130

January 1, 1971

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CONTENTS

I. Abstract

II. Problem

III. Theoretical Rationale and Related Research

IV. Objectives

V. Procedures

- A. General Design.
- B. Population of Subjects.
- C. Data and Instrumentation.
- D. Experimental Manipulations.

VI. Results

- A. Coder's Manual.
- B. Test Homogeneity.
- C. Test Stability.
- D. Discriminant Validity.
- E. Predictive Validity.
- F. Experimental Validation.

VII. Discussion

VIII. References.

IX. List of Tables

1. Spilt-half Reliabilities of Six Verbal Cues
2. Intercorrelations of the Six Story Cues
3. Intercorrelations of Subcategories
4. Test-retest Reliability
5. Intercorrelations between Two Methods and Three Measures
6. Correlations of Origin-Pawn Scores with Academic Achievement Scores
7. Mean Origin-Pawn Scores in Four Experimental Cells

ABSTRACT

Motivation Measure for Elementary School Children
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$10,000.
September 1, 1960 - August 31, 1970

Objectives. To develop a measure of motivation of elementary school children to predict academic achievement independent of intelligence.

Procedures. Three basic steps were proposed to analyze data from approximately 200 Black children. These steps were operational (content) analysis of two free response measures, resulting in a coder's manual. 2) tests of reliability of the measure, 3) tests of the validity of the measure. Procedures included establishment of coder reliability, test homogeneity and stability; determination of discriminant validity, predictive validity, and experimental validity of the new test.

Results indicate that the measure meets criteria which make it useful for experimental purposes and has comparable reliability and validity to other free response measures of motivation (e.g. n Achievement). It is significantly related to verbal measures of academic achievement independent of intelligence. The amount of significant variance accounted for is small. Classroom motivation training units were strikingly reflected in the measure demonstrating its validity experimentally.

II. PROBLEM

To develop for research purposes a measure of motivation of elementary school children that predicts (independent of intelligence) school behavior and standardized academic achievement scores. The measure is to be called the Origin Pawn (OP) measure.

It is commonly believed in educational circles and in psychology that human potential is primarily a function of intellectual capacity. However, a measure of intelligence typically accounts for only about one-third of the variance of academic achievement measures (data available indicate correlations between I.Q. and eight academic measures that range from +.50 to +.72 for 77 Black sixth grade children). Most educators and psychologists would agree that another prominent determinant of school behavior is pupil motivation. Attempts to measure this determinant, however, have been disappointing (de Charms, 1968; Crandall, et.al, 1962).

This project attempted the development of a measure of motivation based on a new theoretical orientation and spurred by some preliminary empirical evidence.

III. THEORETICAL RATIONALE AND RELATED RESEARCH

de Charms (1968) has developed the concept of personal causation and the related shorthand terminology of the Origin-Pawn variable. The phrase "personal causation" is used to emphasize the personal element of motivation and to stress that a motive is an internal thing -- "that within the individual, rather than without, which incites him to action" (Webster's definition). The basic premise

of the theory is that man's primary motivation is to be effective in causing changes in his environment. Man strives to be a causal agent, to be the origin of his own behavior; he strives for personal causation.

This conception of motivation has its roots in Heider's (1944, 1958) theory of the locus of causality for behavior, and is closely allied to Rotter's (1954, 1966) conception of the locus of control of reinforcements and White's (1959) notion of effectance. Personal causation is seen as a broader concept than, but not unrelated to, McClelland's (1953) notion of achievement motivation (n Achievement).

The terms Origin and Pawn are conceived as follows. An Origin is a person who feels that he is in control of his fate; he perceives the locus of causality for his behavior to be internal to himself; in Rotter's (1966) terms he feels internal control over his reinforcements. A Pawn feels that he is pushed around, that someone else pulls the strings and he is the puppet. He perceives the locus of causality for his behavior as external to himself, he lacks control over his reinforcements. The Origin feels potent, the Pawn feels powerless.

More careful definition and specification of what is contained in the two concepts is presented in de Charms (1968 & 1969), Kupermen (1967), de Charms and Carpenter (1969), de Charms, Collins, Jackson & Shea (1969). More precise definition of the concepts at the empirical level is the aim of the development of an empirical measure.

Explicity stated in the theory of personal causation (de Charms, 1968) are guidelines for the development of measures of concepts such as the Origin-Pawn concept. Two points are most important. First, the motive concept can never be completely objectified through operational definitions as they are commonly

conceived. Second, the most important and neglected area of human motivation is the determination of what a person will do under conditions of relative freedom, i.e., where he decides what he will do, rather than where what he will do is strongly influenced by forces external to him.

Both of these statements have implications for the measurement of motives. To assume that a concept can never be completely objectified is not to assume that the same concept cannot be useful scientifically. Here, drawing heavily on Polanyi's (1958) concept of personal knowledge and Bridgman's (1959) concept of the operational analysis of "introspective words in the subjective mode," de Charms contends that the human being becomes the only instrument that can validly define subtle human motivational concepts. The operational analysis suggested and tried by Bridgman in a seminar is, according to de Charms (1968), what is occurring when a group (such as the McClelland group) spend endless hours clarifying concepts such as achievement motivation in order to derive a manual for content analysis. Analysis of specific documents forces rigor into the definition and forges the theoretical concept in the fires of empirical data.

It is this theory that underlies the development of the Origin-Pawn measure out of operational analysis of relatively free responses produced in imaginative productions. To measure motivation with anything approaching a forced choice situation, such as a questionnaire, would not tap the very essence of the Origin concept. The challenge is to find some way to put more rigor into the analysis of responses emmitted by subjects rather than to rigorously control the responses so that they can be easily analysed.

Relevant related research, therefore, involves studies of content analysis as reviewed by Holsti

(1969) and especially the research by the McClelland and Atkinson group (McClelland, et al, 1953, McCelland, 1961, Atkinson, 1958).

Although the Origin-Pawn measure is conceived to be a general measure of motivation, it is particularly appropriate in dealing with Black children if recent evidence such as the Moynihan and the Coleman Reports (Moynihan, 1967, Coleman, 1966) are correct. For instance, the Coleman report indicated that black and white highschool students aspire to go to college in about the same percentages, but the percentage of the Blacks who have taken concrete action toward that goal is far lower than of the Whites. This indicates a discrepancy in the realistic goal setting and planning of the two groups. It is exactly this type of realistic goal setting that is a central element in the concept of the Origin-Pawn variable.

IV. OBJECTIVES

To develop and validate a measure of the Origin-Pawn variable for Black elementary school children by the following steps:

(a) Opertional analysis of creative productions resulting in a Coder's Manual;
(b) Establishment of coder reliability;
(c) Assessment of test homogeneity;
(d) Assessment of test stability;
(e) Determination of the discriminant validity of the test;
(f) Determination of the predictive validity of the test;
(g) Establishment of the experimental validity of the test by direct experimental manipulation of an Origin-trained group to be compared with a non-trained group.

V. PROCEDURES

General Design. Step 1 (operational analysis) derives from Bridgman's (1959) recommendations. In a seminar setting the theory of personal causation and the Origin-Pawn variable was thoroughly discussed and dissected with a view to attaining as clear a view of the concpet as possible and developing clear communication between members of the group. Once the concept was as clear and precise as possible from the *a priori* theoretical analysis, two members of the staff individually turned to the empirical data and looked for embodiments of the concept in the creative stories of children. Extensive consideration of instances in the stories and returning for group discussion eventually resulted, through the logical-empirical method (Margenau, 1950, Feigl & Scriven, 1956-1958), in a coder's manual that is the concrete result of the operational analysis. Two sets of forty protocols were used to refine the manual, test relibilities and train two coders.

Steps 2 and 3 were designed to establish reliability and validity of the measure. Reliability was assessed by computing (1) spilt-half reliabilities of four samples of data, (2) intercorrelations between scores on each individual story and all other stories, (3) intercorrelations between each category score for each protocol and all other category scores, (4) a homogeneity ratio, and (5) test-retest reliability coefficients.

Discriminant validity was assessed by comparing the Origin-Pawn measure for other measures some derived from the same method of content analysis, some derived from different methods. Predictive validity was assessed by computing correlations between the Origin-Pawn measure and nine measures of academic achievement. Experimental validation was assessed by comparing mean Origin-Pawn scores for students given motivation training in the classroom for two

years, for one year, or no training at all.

Population of Subjects. The sample was composed of Ss drawn randomly from those pupils on whom all necessary data were available and equally representing males and females and Experimental and Control Ss. The population comprises all sixth grade pupils (1967-68) in a large urban school district serving primarily low-income Black children.

Data and Instrumentation. The data submitted to operational analysis to derive the Origin-Pawn score resulted from the Test of Imagination. The Test of Imagination (sometimes referred to as the TAT) was administered under conditions described by McClelland et al, (1953) using verbal cues from Winterbottom (1958). The children wrote six stories to the following cues (1) A father and son talking about something important, (2) Two men working at a machine, (3) A boy with his head resting on his hands, (4) A mother and her child look worried, (5) A young person sitting at a desk, (6) Brothers and sisters are playing -- one is a little ahead.

In the classroom an experimenter passed out protocols with one of these cues printed at the top of each page plus the following four questions equally spaced down the page: (1) What is happening? (2) What happened before? (3) What is being thought or wanted? (4) What will happen? Ss were instructed to write imaginative stories to each cue and were allowed four minutes for each story. The Ss in this study produced a mean of approximately forty words per story and the protocols had previously resulted in valid n Achievement scores.

The Children's Picture Test (CPT) was used as a comparison to assess discriminant validity. It was administered under similar classroom conditions but with no time limit. The CPT booklet contained six pages each showing a cartoon with two figures

of children. A balloon above the first child indicated that he made a statement, the balloon above the second child was blank and the subject was instructed to write his response in the balloon. The statements of the first figure were: (1) How come you didn't get what you wanted for Christmas? (2) Why is she always hurting herself? (3) When you grow up do you think you could be anything you wanted? (4) Whenever you're involved something goes wrong. (5) That's the third game we've lost this year! (6) Why does her mother always holler at her? Data from these protocols were scored using Battle's (1963) manual for internal and external control of reinforcements.

No description of the n Achievement scores, standard academic achievement test scores (Iowa Test of Basic Skills, Stanford Achievement Test, Lorge-Thorndike Intelligence Test) will be included here.

Past Research (Carpenter, 1967, de Charms, et al. 1969) resulted in a measure referred to as the Goal Realism Measure. As an outgrowth of Atkinson's (1958) theory of motivation and risk-taking a measure was developed to assess risk-taking in an academic subject (arithmetic). Sixty arithmetic problems were gleaned from elementary school text-books, comprising ten problems each at six levels of difficulty from very easy (e.g., 1 + 2 = ___) to very hard (e.g., 12 lbs. = ___kilograms). This test was administered in the classroom, each child's test scored and a form filled out to inform the child at a glance of his success at each level in terms of probabilities (e.g., 2 out of 10, etc.). In an individual session with an experimenter these probabilities were carefully explained to the child and he then took a test where he could choose for each of ten trials the level of problem difficulty that he preferred. Points were awarded for correct answers scaled to the individual's own level of probability, thus controlling for ability.

The Goal Realism score was the mean of the ten probabilities chosen by the child. Data on a large sample indicate that the Goal Realism Score (mean probability) is significantly correlated with academic achievement scores. Pupils who choose easier items (higher mean probability of success) score higher on standardized achievement tests. This is especially true for boys with arithmetic achievement tests where Goal Realism correlates +.51, and the partial r with I.Q. controlled is +.44. Since this measure is specific to arithmetic and most useful with boys (who are better on arithmetic than the girls in this sample) the need for a more general measure derived from the stories is posited. Nevertheless, this measure can be used to help validate the more general Origin-Pawn measure.

Experimental Manipulations. In the prior research project (de Charms, 1965) that produced the data to be used here a major effort was made to develop classroom training techniques designed to increase motivation in the trained children. As a part of that project a classroom unit called the Origin Manual was developed in collaboration with the classroom teachers.

The manual was about fifty pages long, arranged in twenty five daily exercises, with about twenty minutes required to complete each one. The major stress throughout the manual was on personal responsibility. The children were taught that if they acted like Origins, if they took responsibility for their behavior rather than waiting for the environment to act upon them, that they could become more successful and enjoy themselves more. Another related emphasis was on realistic goal setting strategies. The children learned (a) the concept of goal setting; (b) the importance of self evaluation in making their goals realistic; (c) the blocks or hinderances that impede individuals from reaching goals; (d) the instrumental activity that they could use (e.g., planning carefully, practicing their skills, using feedback

and help from others) in attempting to reach their goals. Most important, they learned that goal setting must be a personal thing, that they themselves must set goals acting like Origins.

Two role-playing exercises in the manual, derived from a study by Kuperman (see de Charms, 1968), showed the children how it feels to be treated like Origins and Pawns. In the Pawn exercise, the teacher strictly controlled the children, acting very authoritatively in directing them in an art activity. Following the exercise the teacher explained what she had done and discussed the powerlessness that one feels when he is treated like a Pawn. On the following day, the teacher had the students perform a similar activity, but this time she allowed them freedom to be creative and to assume responsibiltiy for their project. Again she descirbed what she had done, told them that they had been treated like Origins, and discussed the benefits and responsibilities of acting like Origins.

VI. RESULTS

Coder's Manual. The coder's manual for the Origin measure (Plimpton, 1970) is available from the Author (1). It is complete with practice stories and expert scoring so that it may be used by other researchers. Learning to score reliably demands practice and cannot be accomplished overnight.

After the preliminary manual was developed, a second scorer learned the scoring system to a criterion of 90% agreement with the expert scorer. Training for approximately two hours daily, the new scorer reached the reliability criterion after about one and one-half weeks and about 250 practice stories. The two scorers worked independently while scoring

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and then discussed intensively their discrepancies. These discussions are crucial and should result in written agreements between scorers complete with examples from stories for the scorers to consult in future scoring. Thus, while learning to score, the scorer develops a supplementary manual for himself. This is in the spirit of the concept of operational analysis of introspective material in the subjective mode (Bridgman, 1959). Our impression is that, in general, learning to score may take longer than the example given above, since the novice discussed above had the advantage of lengthy discussions with the person who developed the manual.

After reaching 90% agreement, the second scorer coded a one-third random sample of 525 protocols (N = 175 X 3 protocols for each subject). The percentage of agreement on all categories for these (the actual data) was 90.2%. In scoring each protocol of six stories the scorer made a binary decision for each of the six categories for each story. That is, for each story the scorer decided whether it contained evidence (as specificed in the manual) for each of the following categories: (1) internal control, (2) internal goal setting, (3) internal determination of instrumental activity, (4) personal responsibility, (5) reality perception, (6) self-confidence. Thus for each protocol the scorer made thiry-six such binary decisions. Chance agreement between two scorers working independently would be 50%.

Each category is scored only once per story so that the maximum score that one story can receive is six, the minimum is 0. Since the protocols contained six stories the possible range of scores per subject is from zero to thirty-six (actual range = 0 - 31).

Test Homogeneity. The homogeneity of the test was assessed in four ways: (1) spilt-half correlations were computed on the scores of the odd vs. the even

numbered stories written by each subject; (2) intercorrelations were computed between each story score and all other story scores; (3) intercorrelations were computed between each category score for each protocol and all other category scores; (4) Scott's (1960) homogeneity ratio was computed.

Table 1 presents the spilt-half reliabilities for the four samples used. Sample 3 (N = 175) is here divided into various cells of the experimental design used for experimental validation. Reliabilities range from .35 to .91. The Spearman-Brown (Brown, 1910, Spearman, 1910) prophecy formula was computed for a test twice as long as either half, i.e. the actual length of the test.

Table 2 presents the intercorrelations between each story cue (Items 1 through 6) and each other story cue for each cell of the experimental design.

Table 3 presents intercorrelations between the scoring categories for control subjects only (Cell 4) for both 1968 (6th grade N = 53) and 1969 (7th grade N = 108). Presented here also are the homogeneity ratios for the two samples.

Insert Tables 1, 2, 3 about here

Test-Stability. The stability of the test was assessed by computing test-retest correlations. Table 4 presents test-retest data for tests administered a year apart either at the end of the fifth grade and again at the end of the sixth, or at the end of the sixth and again at the end of the seventh grade.

Insert Table 4 about here

Table 1

Spilt-half Reliabilities of Six Verbal Cues
of the Origin-Pawn Measure
(Cues 1, 3, 5 vs. 2, 4, 6)

	N	r	Spearman-Brown Prophecy
1st Sample	40	+.43	+.60
2nd Sample	40	+.84	+.91
3rd Sample			
Cell 1	57	+.50	+.67
Cell 2	41	+.55	+.71
Cell 3	27	+.51	+.68
Cell 4 (Controls)	50	+.21	+.35
Combined	175	+.66	+.80
4th Sample (Controls)	58	+.65	+.79

Table 2

Intercorrelations of the Six Story Cues on the Origin-Pawn Measure (Untreated Control Ss only)

	Story Cue Number				
	1	2	3	4	5
1					
2	.17				
3	-.08	.04			
4	-.16	.27	.27		
5	.05	.09	.23	.30	
6	-.08	.16	.15	.11	.07

Table 3

Intercorrelations of Subcategories
of the Origin-Pawn Measure
(Untreated Control Ss only)

	Internal Control		Goal Setting		Instru-mental Activity		Reality Percep-tion		Personal Responsi-bility		Self Confi-dence		Total OP	
*	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969	1968	1969
I.C.														
G.S.	.35	.17												
I.A.	.58	.09	.33	.37										
R.P.	.26	.16	.20	.17	.36	.16								
P.R.	.41	.13	-.04	.03	.31	.19	.21	.36						
S.C.	.33	.07	.46	.08	.34	.26	.30	.37	.26	.55				
Total	.72	.27	.67	.53	.75	.56	.59	.68	.46	.67	.71	.69		
Mean Score	0.51	0.07	1.68	1.60	1.00	0.82	0.89	1.36	0.57	1.10	1.01	0.86	5.64	5.77
	0.64	0.06	1.99	1.74	1.15	0.99	1.06	1.95	0.57	1.36	1.10	1.22	15.88	14.18

Homogeneity Ratio (Scott, 1960)
1968 = +.22
1969 = +.31

* 1968 N =53, 1969 N = 108

Table 4

Test-Retest Reliability
(1967 - 68 and 1968 - 69)

	N	r
5th (1967) and 6th (1968) Grades	91	+.414
6th (1968) and 7th (1969) Grades	49	+.384

Discriminant Validity. As a test of discriminant validity the Origin-Pawn scores were compared with (1) n Achievement scores derived from the same story protocols and the Origin-Pawn scores (same measure, different trait), (2) an Origin-Pawn score derived from content analysis of Battle's Children's Picture Test (different measure, same trait), (3) an Internal-External Control of reinforcements score derived from the Children's Picture Test (different measure, related trait), and (4) a Goal Realism score (Shea, 1969) (different measure, related trait). Table 5 presents the intercorrelations between these variables.

Insert Table 5 about here

Predictive Validity. For two different years (i.e., 1968 when the children were in the 6th grade and again in 1969 when the children were in the 7th grade) the Origin-Pawn scores were correlated with various measures of academic achievement taken from standardized tests (The Iowa Test of Basic Skills, The Stanford Achievement Test and two project developed tests of spelling and arithmetic ability called the Carpenter (1967) tests.) Table 6 presents correlations between these nine measures of academic achievement and the Origin-Pawn variable for both years. In addition, the correlations are presented between the achievement measures and results of the Lorge Thorndike ( ) test of intelligence. Finally, the table presents the partial correlations between the Origin-Pawn variable and the academic achievement measures with I.Q. partialed out for both years.

Insert Table 6 about here

Table 5

Intercorrelations between Two Methods and three Measures

(N = 35)

		Method I (Imaginative Stories)		Method II (Children's Picture Tes	
		Measure A Origin-Pawn	Measure B n Achievement	Measure A OP	Measure C I-E
Method	Measure				
I	A (OP)	(.41)*			
	B (nAch)	.22	(.29)*		
II	A (OP)	-.12	-.02		
	C (I-E)	-.13	-.02	.22	(.53)*
	Goal-Realism	.32	.19	.12	.02

* One year repeat reliability

Table 6

Correlations of Origin-Pawn Scores
with Academic Achievement Scores

	1968 OP	1966 I.Q.	Partial r OP_{IQ}	1969 OP	1969 I.Q.	Partial r OP_{IQ}
Carpenter Arithmetic	.05	.38	-.04	.13	.51	-.01
Stanford Arithmetic	-.03	.38	-.13	.17	.45	.05
Carpenter Spelling	.38	.52	.31*	.24	.45	.13
Stanford Paragraph Meaning	.26	.48	.17	.22	.36	.13
Iowa Test of Basic Skills						
Vocabulary	.22	.52	.11	.18	.54	.04
Reading	.21	.51	.10	.23	.61	.08
Language	.29	.54	.19*	.36	.57	.25*
Arithmetic	.20	.46	.10	.17	.52	.03
Spelling	.35	.50	.28*	.23	.42	.14
1968 OP	--	.24		.51	.18	
1966 IQ	.24	--		.27	.73	
1969 OP	.51	.27		--	.27	
1969 IQ	.18	.73		.27	--	

N = 116

* p .05

Experimental Validation. Experimental validation was based on assessment of effects of intensive classroom motivation training carried on in some of the sixth and seventh grade classrooms as part of a large project funded by the Carnegie Corporation (de Charms, 1965, de Charms, et.al., 1969). Table 7 presents mean Origin-Pawn scores for groups of the same subjects at the end of each of three years. They were all measured at the end of their fifth grade before any training. They were then divided on a random basis into experimental and control groups for training (or none) in their sixth grade year. Each of these two groups were again subdivided into experimental and control for training (or none) in their seventh grade year. This design results in four groups: (1) trained in both sixth and seventh grades, (2) trained in sixth only, (3) trained in seventh only, (4) not trained at all. The effects of training on the mean Origin-Pawn score are shown in table 7.

Insert Table 7 about here

VII. DISCUSSION

In general, the stability and homogeneity of the Origin-Pawn measure are all of the order that might be predicted from this type of measure. It is a mistake, however, to expect data comparable to those based on objective tests such as standardized achievement tests or questionnaires. This is a measure of more freely emmitted responses. These procedures for assessing reliability were developed for what McClelland (1965) called a respondent measure rather than the more common operant measure. In the operant measure the subject is allowed freedom to produce his own responses (stories) and the psychologist must find ways (content analysis)to assess his responses.

Table 7

Mean Origin-Pawn Scores in Four
Experimental Cells
(From Plimpton, 1970)

	5th Grade (pre-training)	6th Grade	7th Grade
Cell 1 (Training both years)	5.86	12.89	16.33
Cell 2 (7th Grade training only)	4.39	4.88	11.60
Cell 3 (6th Grade training only)	4.29	11.89	11.48
Cell 4 (No training)	5.68	6.26	5.40

In the respondent measure (questionnaires) the psychologist defines the number of answers which the subject can use. The subject is responding to what the psychologist has presented in a predetermined form. The Origin-Pawn measure is an attempt to find out about the subject at his level -- what he will do on his own, not what he can do when specifically instructed to.

In this light the measures of reliability of the Origin-Pawn measure are quite satisfactory when compared, for instance, to the similar and well established measure of n Achievement. McClelland (McClelland, et.al., 1953) reports interscorer reiabilities measured by percentage of agreement of 78, 85, and 91 percent for n Achievement (p. 186). In the years since the n Achievement measure was developed it has been customary to strive for 90% agreement. A spilt-half reliability similar to that reported here was reported for n Achievement (p. 188) to be +.65. The two Origin-Pawn reliabilities from our data reported in Table 1 that can be compared to that for n Achievement are those for the third sample (Controls) and the fourth sample (Controls). The first (+.35) is inferior, but the second (+.79) is higher than the n Achievement figure.

Repeat reliabilities for a measure of motivation are also problematic. Much can happen to a person's motives between measures, especially when the intervening interval is one year. Nevertheless the repeat reliabilities reported here for the Origin-Pawn measure are substantially larger than one reported by McClelland et. al. (1953, p. 192) for n Achievement. They reported a correlation of +.22 for equivalent forms of the n Achievement measure administered one week apart. For the Origin-Pawn measure administered a year apart the test-retest reliability is +.41 for one sample and +.38 for another. In our own data the test-retest reliability (a year apart) for n Achievement was +.29 for a sample of 185 subjects.

The data presented in Table 5 concerning discriminant validity are not very revealing. The correlation between the Origin-Pawn measure derived from the stories and alternately from the Children's Picture Test is -.12. This result, where a positive relationship would be expected, may be attributed to the differences between the two methods of collecting data (imaginative stories vs. the cartoons of the Children's Picture Test). Unfortunately, however, it can also be attributed to the possible unreliability of the scoring of the Children's Picture Test. It had been hoped that this scoring could be developed to a point where a valid comparsion could be made, but when this negative correlation was found it was decided to terminate perfecting the content analysis of the Children's Picture Test for the Origin-Pawn measure and to concentrate entirely on the manual for the Imaginative stories which produced a much larger sample of thoughts that had already been demonstrated to yield a reliable and valid measure of n Achievement. In Table 5 it can be seen that the Origin-Pawn measure from the imaginative stories does correlate with goal realism (+.32, $p < .05$). This is a first step toward assessing predictive validity.

The predictive validity of the Origin-Pawn measure was assessed in this project primarily by relating it to standardized measures of academic achievement. The goal was to determine a non-intelligence type test of motivation that would predict a significant amount of variance in academic achievement independently of intelligence. It was not expected that a large proportion of the variance would be accounted for and it was not. The first order correlations between the Origin-Pawn measure and the measures of academic achievement are all small, but on the language subtest of the Iowa Test of Basic Skills the correlation is significant even with I.Q. held constant. That is, on the language test (replicated twice) the Origin-Pawn measure increases our predictive ability when used in conjunction with I.Q.

and independently of it. In the sixth grade the Origin-Pawn measure also accounts for significant variance in two spelling tests independently of I.Q.

The most striking results of this project come from the experimental validation. There is no question that the classroom motivation training to be more motivated strongly and significantly affected the scores on the Origin-Pawn measure. In every case where training intervened between testing periods the mean score increased very significantly ($p < .001$). In no case where training did not interven in a comparable period did the scores increase significantly. Most interesting also is the finding that one year of training increases the mean score and after a year of no training the effects of the training have not dissipated at least as measured by the Origin-Pawn measure.

Theoretically it seems justified to say that the Origin-Pawn measure has been demonstrated to be sufficiently reliable and valid to be used for experimental purposes. More work needs to be done in establishing its discriminant and predictive validity. It does predict significant variance in language measures and in a goal realism measure and it responds sensitively to classroom motivation training.

Practically the measure is not and was never intended to be an instrument for assessing or diagnosing individual students. The results reported here show an encouraging start in developing a measure for experimental use and further work is in progress (de Charms, 1971) that will give further evidence for predictive validity of the measure. In the larger project (de Charms, 1965) of which this was only a part it has become evident that the measure is a valuable tool for measuring the effects of motivation training, but that simply to measure and try to predict academic achievement is not nearly as rewarding as attempting to produce changes through motivation training.

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